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Patent Application of

Michael Weinberger

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for

TITLE: HEARTH ILLUMINATOR

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CROSS REFERENCE TO RELATED APPLICATIONS: Not Applicable

FEDERALLY SPONSORED RESEARCH: Not Applicable

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SEQUENCE LISTING OR PROGRAM: Not Applicable

#### BACKGROUND OF THE INVENTION -- FIELD OF INVENTION

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This invention relates to hearths in simulated or actual fireplaces, specifically, it provides a method and apparatus for illuminating hearths with a convenient, single, disposable fuel cartridge that provides realistic looking multiple flames emanating from underneath and in between non-combustible twigs and logs, cast as a single logset, in the form of a unitary body, with multiple

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openings on top.

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BACKGROUND OF THE INVENTION

5 Many people desire the ambiance created by a fireplace. Some homes and apartments, however, cannot accommodate a real wood burning or gas fired fireplace. Exhaust problems, the lack of a chimney, cost or other issues can make the construction of a real fireplace problematic.

10 Some consumers have therefore opted for simulated fireplaces. Simulated fireplaces do not burn wood and have no gas burner, chimney, flue, or exhaust system. Instead, they simulate the effect of a real fireplace by using fuels like alcohol gel that require no exhaust system. Such an alcohol fuel is described,  
15 for example, in US patent 4,575,379 to Browning.

Although alcohol gel fuel is mentioned herein, it should be understood that it is mentioned only for exemplary purposes and that it is readily understood by those of ordinary skill in the art that similar fuels can be used.

20 Research has revealed three main types of simulated fireplaces that use alcohol or similar fuels and are sold on the market today. Each will be described subsequently. None of these three types, however, combine the following desirable features: (a) a realistic looking fire, (b) consisting of multiple  
25 flames, (c) which peak and flutter in between and from underneath logs and twigs of different sizes, (d) where the logset has been cast as a convenient, single-piece unit, (e) which itself sits over a convenient, single piece disposable fuel cartridge, (f) which fuel cartridge can have various configurations that will produce different types of fires, such as a one hour fire, a three hour fire, or a  
30 fire with multiple flames that are either larger or smaller.

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5           Instead of producing this result, the three main types of simulated  
fireplaces sold today suffer from the following disadvantages

Type 1: The Two Dimensional Log System

10           The simulated fireplaces sold by Jensen Metal Products of Racine,  
Wisconsin, are typical of this type. They use 2 - 3 cans of a gelled alcohol  
fuel that are placed behind a two dimensional looking fake log. The log has  
height and width in the same way that a miniature brick wall has height and  
width, but it does not extend over and around the cans of fuel. The log has  
15 no more depth than a miniature brick wall.

          As a result, fire rises from behind the two dimensional looking fake log.  
The fire does not have individual, multiple flames that peak and flutter in  
between and from underneath logs and twigs of various sizes. The over-all  
20 effect, therefore, does not look like a fire in a real fireplace.

          In addition, this system inconveniently uses multiple cans of fuel, as  
opposed to a convenient, single piece, disposable, fuel cartridge, whose  
configuration can be varied to produce different types of fires.

25           Moreover, the cans of fuel used in this system are meant to burn about  
two to three hours, although there are variations in burn time from can to can.  
Because the cans are meant to burn about two to three hours, if a consumer  
wants a one hour fire, for example, the fire in the cans has to be extinguished  
30 about half way through the fire. Then the cans have to be resealed. If the

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5       cans are not resealed the fuel remaining therein will evaporate and may also  
give off odors.

10       Another drawback is that even if the consumer wishes to burn the entire  
contents of each can of fuel, because the burn time of each can vary, two  
cans can go out when their fuel is exhausted, leaving only one can of fuel still  
burning. The fire produced by this single remaining can will be small and  
unsatisfying and will not resemble the fire of a real fireplace.

15           Type 2:       The Multi-Piece System

20       Fireplaces sold by the Sunor Division of "2 Burn, Inc", of West Allis,  
Wisconsin, are typical of this system. It also uses multiple cans of fuel that  
are placed behind and underneath a series of pieces of fake logs. Although  
this system can result in a fire that peaks in between pieces of logs, it suffers  
from other drawbacks, such as: (1) the consumer still has to open, light, and  
perhaps subsequently reseal multiple cans of fuel; (2) the consumer has to  
physically handle or place multiple pieces of fake logs over or around the cans  
25       of fuel, and move these logs every time access to the series of cans is  
required, such as for resealing the cans; (3) every time the pieces of fake  
logs are physically moved into or out of position there is a possibility that one  
or more pieces will drop out of position and break; (4) the use of multiple  
cans of fuel and multiple pieces of fake logs is inconvenient when compared to  
30       the use of a one piece disposable fuel cartridge and a one piece logset.

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5           In addition, because these cans of fuel are also meant to burn about two to three hours, again, the consumer cannot chose a one hour fire without moving the log pieces in the middle of the fire, manually extinguishing the fire, resealing the cans and then manually placing the log pieces back in position.

10           Also, if the consumer wishes to burn the entire contents of each can of fuel, several cans will go out when their fuel is exhausted. This will leave only one can of fuel still burning. Again, the fire produced by this sole remaining can will be small and unsatisfying and will not resemble a real fireplace fire.

15           Type 3:     Pourable Fuel System

          The fireplaces sold by La Flame Industries Inc., located near Minneapolis, Minnesota, are typical of this type. They use a burner system generally  
20       discussed in US patent 4,582,478, to Hilker. This system does not use cans of fuel, but rather, uses fuel which has to be poured from its original container into one or more special receptacles underneath and/or behind one or more fake logs. This system requires the storage, in the consumer's home, of a partially filled original container of fuel that has been opened and partially used.  
25       In addition, because liquid fuel has to be poured from its original container there is a possibility of fuel spillage. Moreover, when used with a two dimensional type, "miniature brick wall" fake log, systems that use pourable fuel do not create a fire with individual flames that peak and flutter in between and from underneath logs and twigs. This critical element is required in order to  
30       simulate a realistic looking fireplace fire.

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Disadvantages Common to the Prior Art

Some of the same drawbacks, and others, are also apparent in prior patents for simulated fireplace burners. For example, US patent 4,890,600, to Meyers, describes a fireplace simulation unit that burns multiple cans of fuel, as opposed to fuel in a one piece disposable cartridge that can produce different types of fires. Moreover, according to this patent, this system requires an "elongated light bulb", a "reflection wheel", "reflection strips" and an "amber-red colored lens" to produce the "illusion" of a realistic fire.

Similarly, US patent 4,838,781, to Fischer, for a "containerized fuel fireplace insert" is primarily designed, in the words of this patent's abstract, to provide "for easy ignition and replacement of fuel containers and controlling the burning rate of fuel." It uses multiple cans of fuel and does not describe the use of a single, disposable, pre-manufactured fuel cartridge whose configuration can be varied to produce fires of different duration and size. Nor does it use a single piece logset that melds together logs and twigs of various sizes and shapes. Nor does the patent describe a fire with multiple flames that peak and flutter in between and from underneath the logs and twigs. Instead, Figure 1 of this patent shows a single horizontally shaped fire.

Likewise, US patent 4,637,372, to Mogol, does not use a one piece, premanufactured, disposable fuel cartridge. Instead, it uses pourable liquid fuel that has to be stored in a consumer's home in its original container. Moreover, this patent does not describe or illustrate a one piece logset with various logs

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5 and twigs of different sizes melded together so that fire peaks and flutters in between and from underneath the logs and twigs.

Along the same lines, US patent 4,582,478, to Hilker, describes a system that uses a liquid fuel supply, as opposed to a one piece, premanufactured,  
10 disposable fuel cartridge. Moreover this patent states it uses a "hand operated valve" to control the flow of the liquid fuel. In addition, the patent does not use a one piece logset. Instead, the patent states that it employs "a plurality of non-combustible logs".

15 Similarly, US patent 4,573,905, also to Meyers, states that it employs multiple "canisters" of fuel along with multiple "log pieces". This patent does not describe the use of a one piece logset and a single, disposable fuel cartridge. Instead, this patent says it uses "a fluorescent light fixture" and a "glass covered cutout" to create the illusion of a real fireplace fire.

20 Likewise, US patent 4,076,490, again to Hilker, does not describe a fire with multiple flames peaking and fluttering in between and from underneath a series of differently shaped logs and twigs. Rather, this system uses a large fake log which is hollowed out for holding fuel. This system does not use a  
25 pre-manufactured and disposable fuel cartridge. Instead, it requires fuel to be poured into the hollow log. Holes in the hollow log allow fire to rise from above the surface of the log but there is no fire from underneath the log and no fire in between logs. Similar drawbacks exist in another version of a hollow log described in US patent 3,993,430, to Forker.

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BACKGROUND OF INVENTION - OBJECTS AND ADVANTAGES

The objects and advantages of the hearth illuminator described herein are:

10 (a) to use a convenient, one piece, disposable fuel cartridge whose configuration can be varied to produce different types of fires, such as fires that last longer or shorter, have more or fewer flames, either larger or smaller;

15 (b) to use the fuel cartridge described in (a) to provide a realistic looking fire with multiple flames that peak and flutter in between differently shaped logs and twigs (which may or may not be similar in size and/or shape);

20 (c) to use the fuel cartridge described in (a) to provide a realistic looking fire with multiple individual flames that peak and flutter from underneath differently shaped logs and twigs;

25 (d) to use the fuel cartridge described in (a) in conjunction with a one piece, three dimensional logset that sits in front of, over, and on either side of the fuel cartridge;

(e) to provide a logset of cast or other unitary structure so that it has multiple openings on the top for flames to emanate out of;

30 (f) to provide a logset of cast or other unitary structure so that it has logs and twigs of the same or different sizes and shapes.



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5           Further objects and advantages are to provide a system for illuminating  
hearth in either simulated or real fireplaces with a realistic looking fire that is  
produced with a maximum of convenience by using a single piece,  
premanufactured, disposable fuel cartridge insert, along with a single piece  
logset.

10           Still further objects and advantages are to produce the above result with  
a simple two piece system, consisting of a logset and fuel cartridge, which is  
easy and inexpensive to manufacture. This system produces a realistic looking  
fire that peaks and flutters in between and from underneath the logset, but  
15 without valves, electric lights, multiple cans of fuel, multiple pieces of logs or the  
other components in the prior art or in known presently available systems.

20           Yet another advantage is to provide a fire that self extinguishes in a  
uniform fashion, with all the flames going out within a close time proximity to  
each other, as the last of the fuel in the one piece fuel cartridge is consumed.

## SUMMARY

25           In accordance with the present invention a hearth illumination system for  
use in simulated or real fireplaces that uses a one piece disposable fuel  
cartridge, in conjunction with a one piece logset, to produce multiple flames that  
peak and flutter in between, and from underneath, differently shaped logs and  
twigs, where the disposable fuel cartridge is capable of being configured in  
30 different ways so as to produce fires with different characteristics.

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DRAWINGS -- FIGURES

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Figure 1 shows one configuration of a metal, single piece disposable fuel cartridge for use in conjunction with the single piece logset, with the lid on top of the fuel cartridge removed, thereby creating a fuel exit aperture.

Figure 2 shows a single piece logset designed for use with the single piece fuel cartridge shown in Figure 1.

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Figure 3 shows a top and side view of the one piece logset.

Figure 4 shows a rear view of the one piece logset, with a cavity adapted for receiving the fuel cartridge.

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Figure 5 shows the fuel cartridge illustrated in Figure 1 located underneath and partially surrounded by the logset illustrated by Figure 2.

Figure 6 is a cut-away showing the fuel cartridge through the logset.

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Figure 7 shows flames that will peak and flutter in between, and from underneath, the logs of the logset shown in Fig 2 when the alcohol gel in the fuel cartridge illustrated in Figure 1 is ignited.

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Figure 8 is a cross-sectional view, taken along Line 8 of Figure 7, and showing the fuel cartridge surrounded by the logset.

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DRAWINGS -- Reference Numerals

- 19 Fuel cartridge
- 20 Frontwall (and/or backwall) of metal fuel cartridge
- 10 21 Sidewall of metal fuel cartridge
- 22a Top of fuel cartridge, with lid removed
- 22b Lid of fuel cartridge
- 23 Fuel exit aperture in top of fuel cartridge when lid removed
- 24 Exposed fuel
- 15 25 One piece logset
- 26a-g Flame exit openings on top of one piece logset
- 27 Frontwall of one piece logset
- 28 Sidewall of one piece logset
- 30 Partial backwall of one piece logset
- 20 32 Rear view of inside of front wall of logset
- 33 Top of one piece logset
- 34 Top of fuel cartridge, sitting in logset, with lid removed
- 36 Exposed fuel
- 38a-c Flame
- 25 40 Flame development gap between bottom of logset and top of fuel cartridge

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5 DETAILED DESCRIPTION OF THE PRESENTLY PREFERRED EMBODIMENT

The presently preferred embodiment of the Hearth Illuminator is illustrated in the figures. Fig 1 is a one piece, disposable fuel cartridge **19** made out of thin gauge metal such as the type used for soda cans or disposable broiler  
10 pans. The fuel cartridge **19** is filled with gelled alcohol **24** or similar fuel. When shipped from its place of manufacture the fuel cartridge **19** will be fully sealed.

The fuel cartridge **19** consists of front and back walls **20**, sidewalls **21**  
15 and a top **22**. The top **22** also has a lid **22b**. When the lid **22b** is removed a fuel exit aperture **23** is created which exposes the fuel **24** to ambient oxygen.

Figures 2 - 4 show one configuration for a single piece logset **25** which is made to accept the fuel cartridge **19** shown in Figure 1. The logset **25** can  
20 be made out of fireproof concrete, ceramic or other suitable fireproof material. The logset **25** has a front wall **27**, sidewalls **28**, partial backwalls **30** and a top **33**.

The logset **25** has multiple openings **26a-g** to allow multiple flames *in*  
25 *between* logs. For example, the figures depict seven such openings, although this number can vary.

As shown in figure 8, in this embodiment the underside of the top of the logset **25** sits about one half inch above the top of the fuel log **19**. The size  
30 of this flame development gap **40** can vary. The flame development gap **40**

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5 aids airflow and allows the flames **38a-c** to form and emanate from underneath  
the logs of the single piece logset **25**.

### Operation

10 To operate the hearth illuminator in accordance with the present invention  
one removes the lid **22b** from the fuel cartridge **19** thereby exposing the alcohol  
gel fuel **24**.

15 The manufacture of alcohol gel fuel is well known to those of ordinary  
skill in the art. Such manufacturing procedures are discussed in US patent  
4,575,379 to Browning and in the patents cited therein. Similarly, the  
manufacture of thin gauge metal cartridges is well known to those of ordinary  
skill in the art. Thin gauge metal is used for soda cans, disposable broiler  
20 pans, cans that hold buffet table warming fuel and similar items.

The fuel cartridge **19** is centered underneath the logset **25**, as show in  
Figure 5. Both the fuel cartridge **19** and the logset **25** are positioned inside  
the noncombustible firebox of a fireplace, either real or simulated.

25 The alcohol gel fuel **24** is then ignited. This will produce multiple flames  
**38a-c** which will peak and flutter in between and from underneath the logs and  
twigs of the logset **25**, the way flames come from underneath and in between  
logs in a real fireplace. When the all of the alcohol gel **24** in the fuel  
30 cartridge **19** has burned the fuel cartridge **19** is simply thrown away.

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Alternative Embodiments

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Variations in the configurations and measurements of both the fuel cartridge **19** and the one piece logset **25** can result in variations in operation. Variations in the fuel cartridge **19** that have larger fuel exit apertures **23** will expose more fuel **24**, resulting in more, and/or larger, flames **38a-c**. Likewise, smaller fuel exit apertures **23** will expose less fuel **24**, resulting in smaller, and/or fewer, flames. Assuming fuel cartridges **19** holding identical amounts of fuel, the smaller and/or fewer flames will burn longer than larger and/or more numerous flames, and vice versa.

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Aside from varying the absolute and relative dimensions of the fuel cartridge **19** and its fuel exit aperture(s) **23**, variations are also possible in the size and shape of the logset **25**, as well as the number, size and shape of its flame exit openings **26a-g**. These variations can produce different fires with more (or fewer) flames that can be larger (or smaller) and can last for longer or (shorter periods) of time.

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All the alternative embodiments, however, share the same key features of the invention. Specifically, they will all employ a single, premanufactured, disposable fuel cartridge **19**, sitting underneath a single piece logset **25** with multiple flame exit openings, configured to produce multiple flames emanating from in between and underneath the logset.

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Thus, the scope of the invention should be determined by the appended claims and their legal equivalents, rather than by the specific measurements of the exemplar fuel log and logset illustrated in the figures.

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Advantages of the Present Invention

From the description above, a number of advantages of the Hearth Illuminator system, according to the present invention, become evident:

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(a) the system uses a convenient, one piece, disposable fuel cartridge, versus multiple cans of fuel or liquid fuel;

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(b) the dimensions of the fuel cartridge can be varied to produce different types of fires, such as fires that last longer or shorter, with more or fewer flames that can be larger or smaller;

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(c) the fuel cartridge is used in conjunction with a convenient single piece logset with multiple openings and differently shaped logs and twigs, as opposed to multipiece logsets or individual logs that resemble miniature brick walls;

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(d) the system produces a realistic looking fire with multiple flames that peak and flutter in between, and from underneath, the differently shaped logs and twigs of the one piece logset;

(e) the system's two components are easy and inexpensive to manufacture.

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